

frequently observed, but the remarkable course of the right ureter to the left side, and its opening into the left half of the bladder, is one of the greatest rarities. To explain this latter malformation, we must assume that the portion of the ureter, which lay on the left side, originally belonged to the left ureter, so that, consequently, the upper half of the left, and the lower half of the right ureter were deficient, while the halves which were formed united to constitute one ureter, half belonging to each side. If this explanation be correct, the malformation must have taken place at a very early period of the development of the ureters, at a time in which both ureters consisted only of rows of cells, lying parallel to one another; for, in the period immediately following, the ureters are mutually too remote to admit of the hypothetical fusion taking place. Possibly there is a time at which the first foundation of both ureters consists of a single row of cells, which subsequently divides by a separation of the cells in a certain direction into two rows; in that case the occurrence can be explained by supposing that after this separation the development of the left superior and of the right inferior row of cells was arrested, and so but a single series remained.—*Dublin Journ. Med. Sci.*, Aug. 1858.

MATERIA MEDICA AND PHARMACY.

7. *Influence of Liquor Potassæ and other fixed Caustic Alkalies upon the Therapeutic Properties of Henbane, Belladonna, and Stramonium.*—In our No. for April last (p. 501), will be found some interesting observations on this subject, communicated to the Royal Medical and Chirurgical Society by Dr. A. B. GARROD.

Dr. G. has since (June 22, 1858), read before the same society a second paper, the object of which was:—

1. To prove that the active principles of the plants under consideration are absolutely destroyed by the influence of the caustic alkalies.
2. To show the ratio which must exist between the different preparations of the plants and the alkalies for the neutralization to be perfect.
3. To ascertain the time demanded for the decomposition to be complete.
4. To illustrate clinically the influence of the alkali in preventing the occurrence of symptoms, and removing such when large medicinal doses of these solanaceous drugs are administered.

Dr. Garrod, before proceeding to discuss these various heads, brought under notice a few points relating to the nature of liquor potassæ, and the properties of some of the officinal preparations of henbane, etc., showing that the former, although strongly caustic, still possessed but little neutralizing power, containing so small an amount of potash, not more than 6.7 per cent.; and that most of the preparations of henbane, belladonna, and stramonium, as the tinctures and extracts, were strongly acid in reaction, and hence, before the alkali could act upon the active principles contained in them, it must first neutralize this acidity, next separate the alkaloids from the acids with which they naturally are combined in the plants; that, therefore, much more was required (measured by the physiological or therapeutic strength of the drugs) to neutralize the galenical preparations than their alkaloids, or the active principles themselves. To prove that the active principles were absolutely destroyed by the alkali, he (Dr. Garrod) performed several experiments in the following manner: A solution of atropine was made by dissolving it in water, with the aid of a little spirit, dividing the solution into two parts, adding to one some carbonate of potash, to the other a sufficiency of liquor potassæ, and permitting both to remain for some hours. Chloroform was afterwards well shaken with both solutions, and allowed to subside, the supernatant fluid being poured off, and the chloroform washed with a little distilled water. Each portion was evaporated spontaneously in glass dishes. From the solution to which carbonate of potash had been added, a gummy matter was obtained (soon, however, becoming crys-

talline), a solution of which dilated the pupil intensely; and when acidulated with hydrochloric acid, and chloride of gold dropped in, gave rise to the beautiful plumose crystals of the double chloride of gold and atropine. From the second solution, that to which liquor potassæ had been added, a strong-smelling substance was left, on the evaporation of the chloroform, having no power of dilating the pupil, and giving rise to no crystallization with the gold salt. These experiments demonstrated beyond doubt the absolute destructive agency of the caustic alkali upon the active principles. It was also shown that most other alkaloids, as morphia, quinine, cinchonine, etc., were not so destroyed. To show the ratio which must exist between the different preparations of the plants and the fixed alkali, in order that neutralization may be perfect, Dr. Garrod gave the results of more than sixty experiments and observations in a tabular form, from which it appeared that when atropine is acted upon by liquor potassæ, the destructive influence of the latter is so great that less than twenty minims are required to neutralize one grain of the former, and that probably pure potash will destroy its own weight of atropine. That when belladonna preparations are employed, the power of the potash becomes weakened, from the causes above alluded to, namely, the natural acidity of the drugs, and the necessity of first displacing the alkaloid from the acid with which it is combined; still, however, it was shown by the table that fifteen minims of liquor potassæ will destroy a fluidrachm of the tincture, and that twenty-five minims are sufficient to produce the same change in five grains of the extract; at once demonstrating that quantities very greatly beyond the medicinal doses of these drugs—indeed even poisonous amounts—are rendered quite inert by very moderate addition of the alkaline solution. The same was found to hold good in the case of daturine and the preparations of stramonium. Ten minims of liquor potassæ will neutralize a drachm of tincture of henbane, and thirty minims destroy nine grains of extract of henbane, although when ten grains are employed, dilatation will often ensue from a small portion of the extract, less than one grain being left free; and it should be observed that a very minute proportion of these preparations is amply sufficient to induce the effect. Of course, these extracts and tinctures are liable to variation in strength, acidity, etc., circumstances which must necessarily produce an alteration in the requisite amounts of liquor potassæ required for complete neutralization. With even the best extract, however, procured from one of the first druggists in town, it was found that nine grains were destroyed by the above-named quantity of potash. Nine grains of good extract of henbane and three fluidrachms of good tincture of the same may be considered as doses of the drugs, which few practitioners would prescribe; yet these are destroyed by thirty minims of liquor potassæ, proving, beyond all doubt, that in the proportions prescribed in actual practice a total neutralization of effect ensues. To ascertain the required time, Dr. Garrod made experiments with solutions of atropine, and commenced the observation shortly after the addition of the potash. In an hour and a half the effect on the pupil was much diminished, and in two hours and a half ceased altogether. The influence of the alkali in preventing the occurrence of symptoms, and removing the same when large medicinal doses of these solanaceous drugs are administered, was clinically illustrated by the narration of several cases, in which, after very decided effects had been induced by henbane or belladonna preparations, the addition of a very small quantity of liquor potassæ to the draught (the patient continuing the other drugs) quickly caused the cessation of the symptoms; and again, other instances where the withdrawal of the liquor potassæ from a combination was followed by the occurrence of powerful symptoms. From these observations and experiments, Dr. Garrod concluded that the liquor potassæ possessed the peculiar power of destroying the active principles of henbane, belladonna, and stramonium, even when in very dilute solutions, and that the combinations frequently prescribed are utterly incapable, both in a chemical and therapeutical point of view.—*Med. Times and Gaz.*, July 10, 1858.

8. *Action of Solutions of Chlorate of Soda and Chlorate of Potash on False Membranes extracted from the Air-passages.*—In order to show the solvent action
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